EDITED SAMPLE

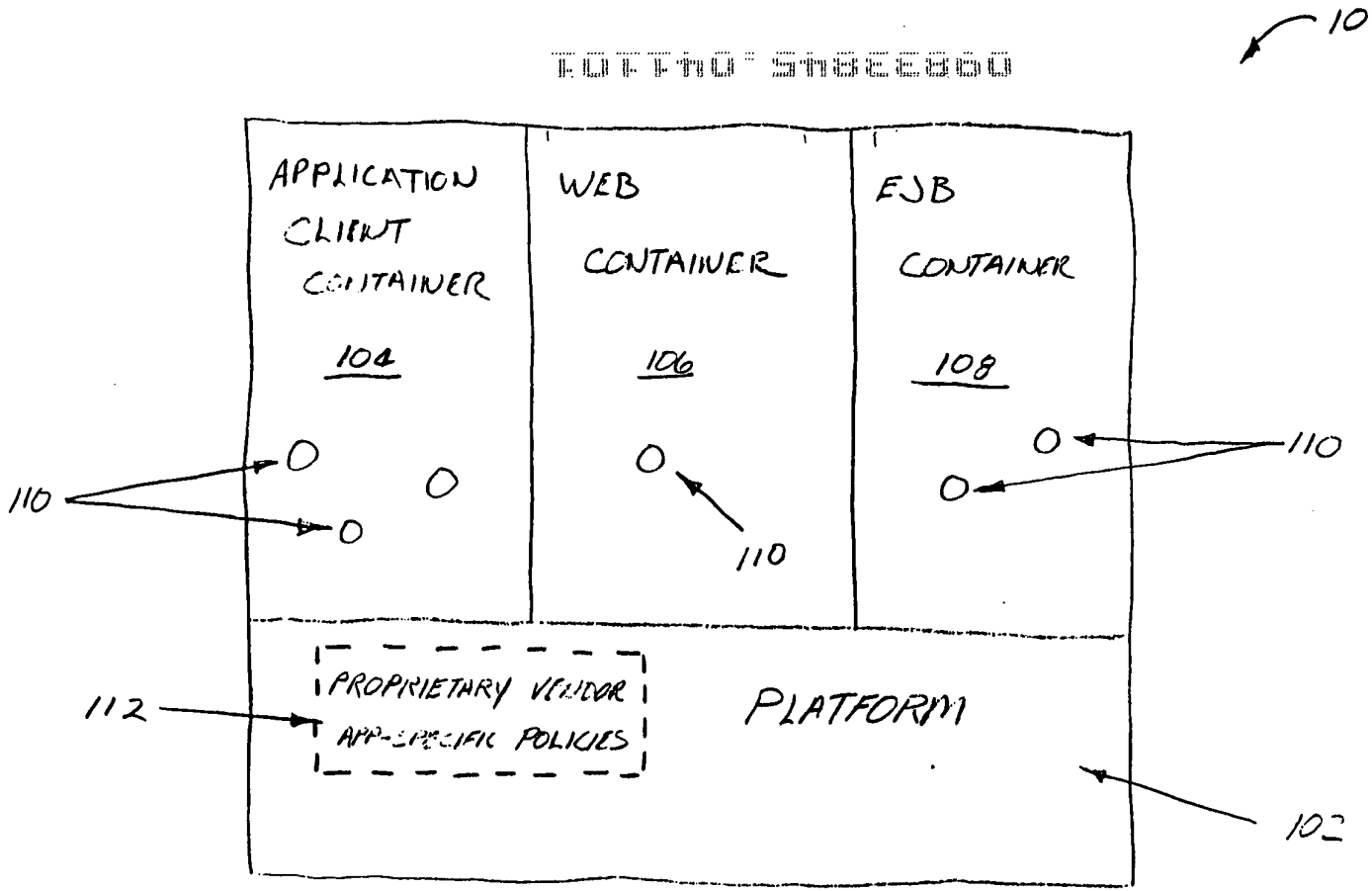

Fig. 1
(PRIOR ART)

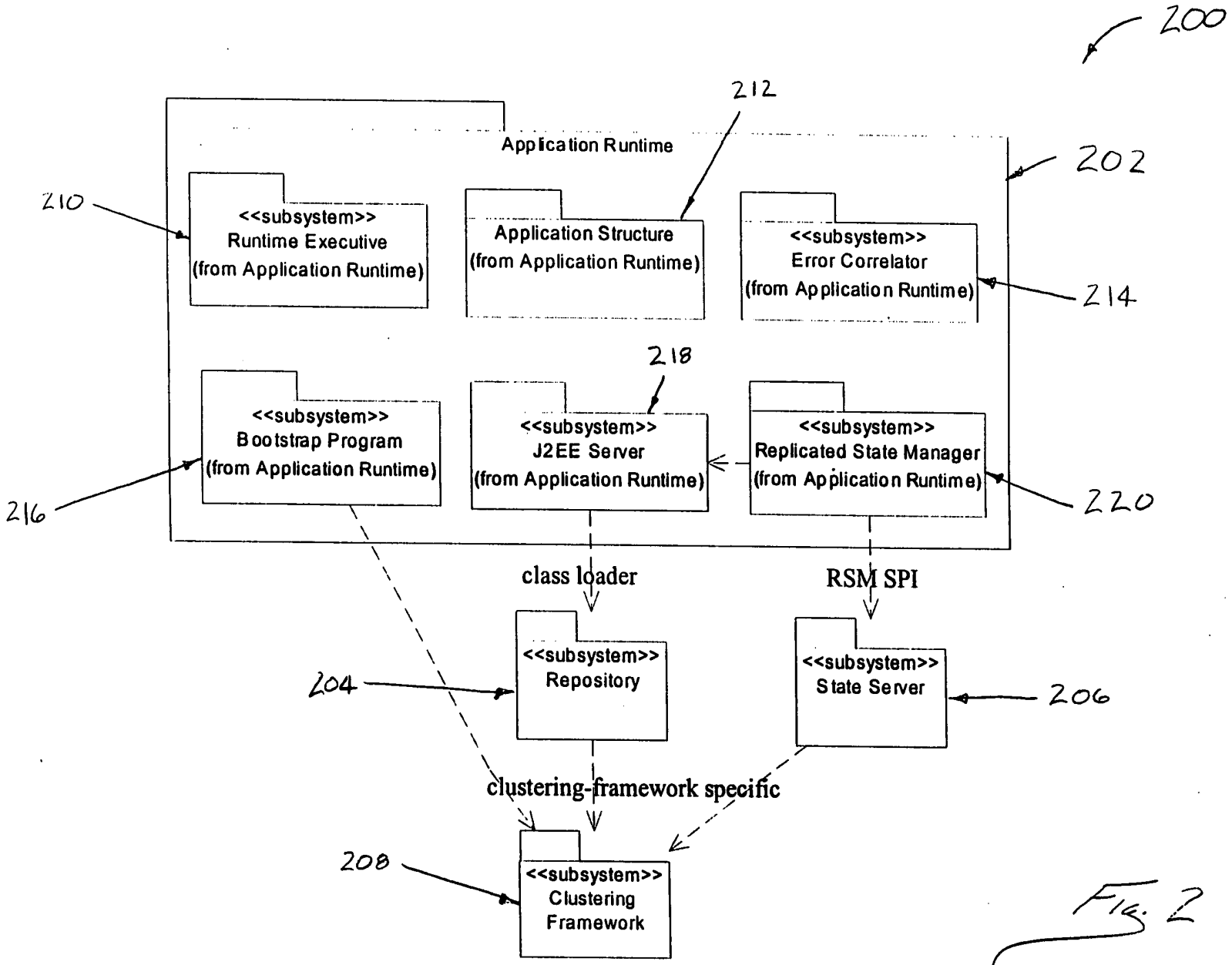
200
212
Application Runtime
202
210
<<subsystem>>
Runtime Executive
(from Application Runtime)
Application Structure
(from Application Runtime)
<<subsystem>>
Error Correlator
(from Application Runtime)
214
218
<<subsystem>>
Bootstrap Program
(from Application Runtime)
<<subsystem>>
J2EE Server
(from Application Runtime)
<<subsystem>>
Replicated State Manager
(from Application Runtime)
216
220
class loader
RSM SPI
<<subsystem>>
Repository
<<subsystem>>
State Server
204
206
clustering-framework specific
208
<<subsystem>>
Clustering
Framework

Fig. 2

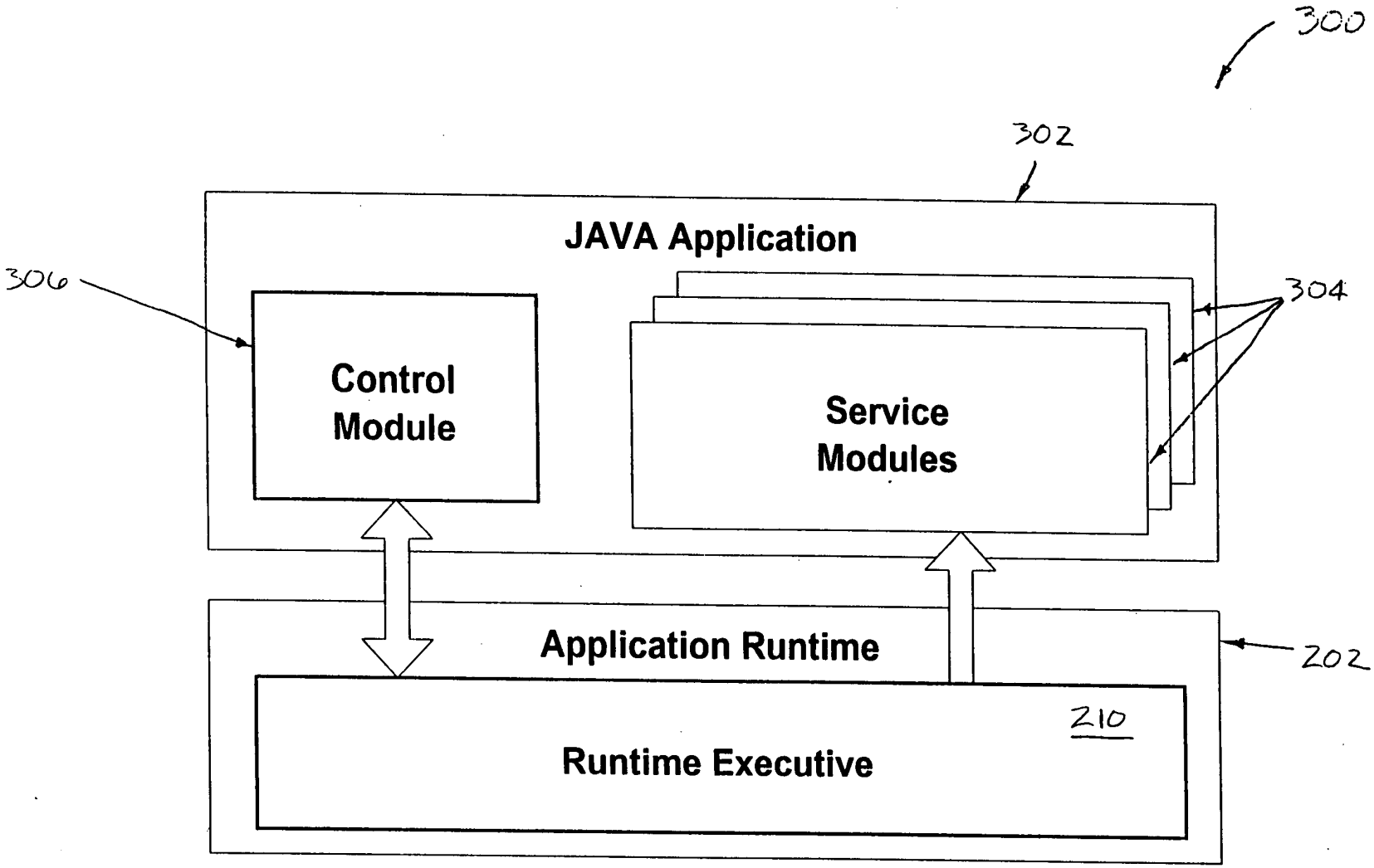
300
302
JAVA Application
306
Control Module
304
Service Modules
Application Runtime
202
210
Runtime Executive

Fig 3A

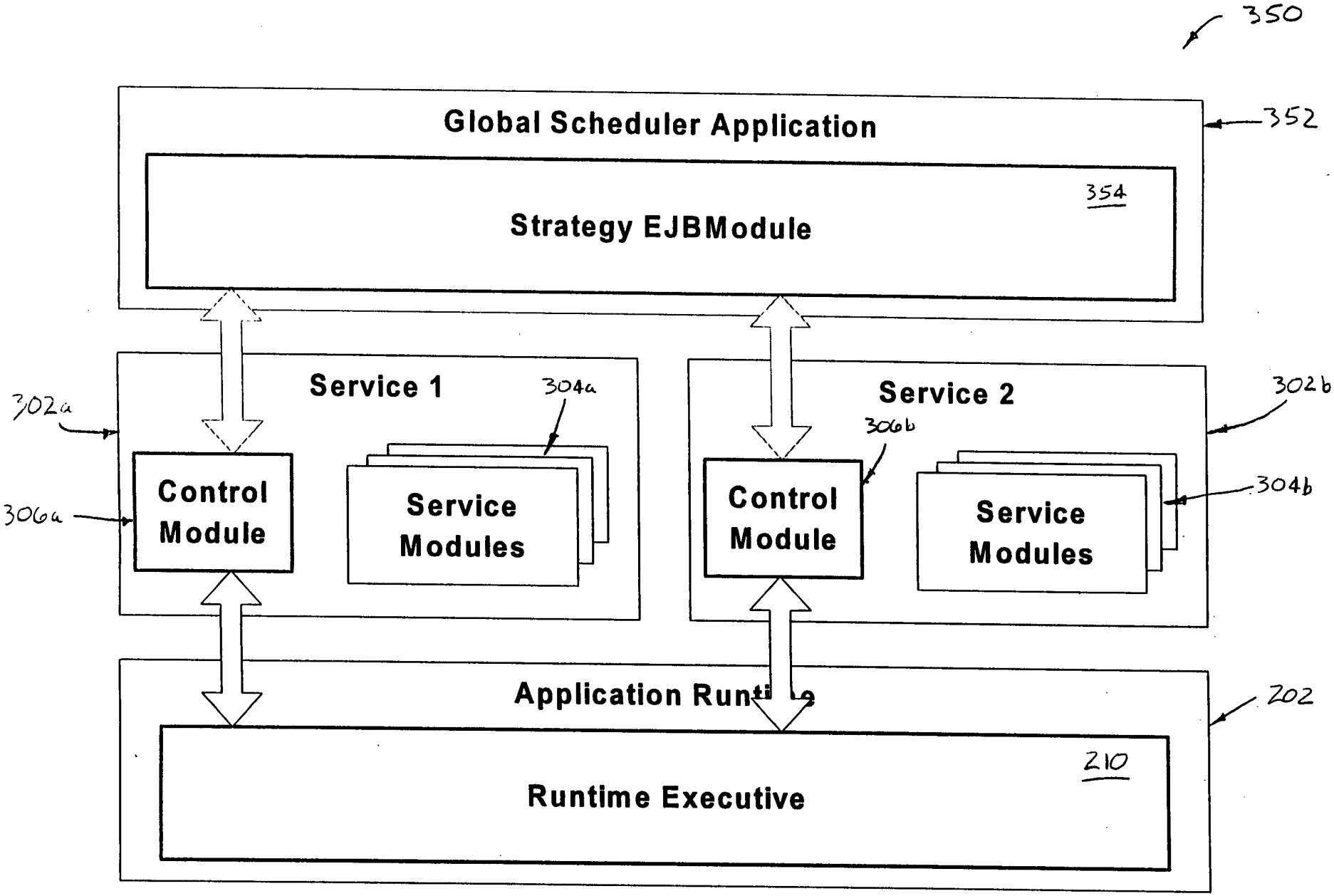
350
Global Scheduler Application
352
354
Strategy EJBModule
Service 1
304a
302a
Control Module
306a
Service Modules
Service 2
302b
306b
Control Module
304b
Service Modules
Application Runti
202
210
Runtime Executive

Fig 3B

FOUND SHEET

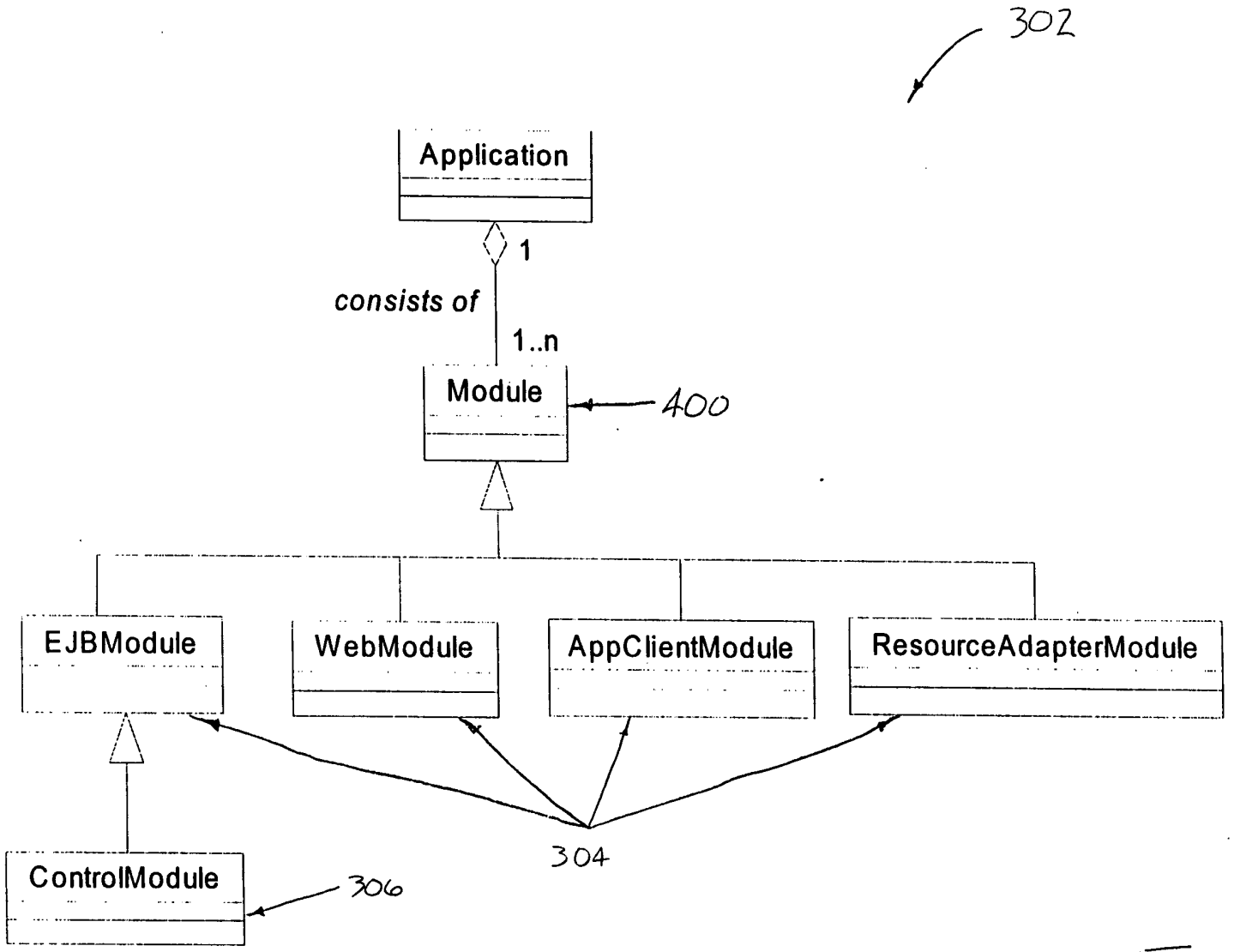

Fig 4

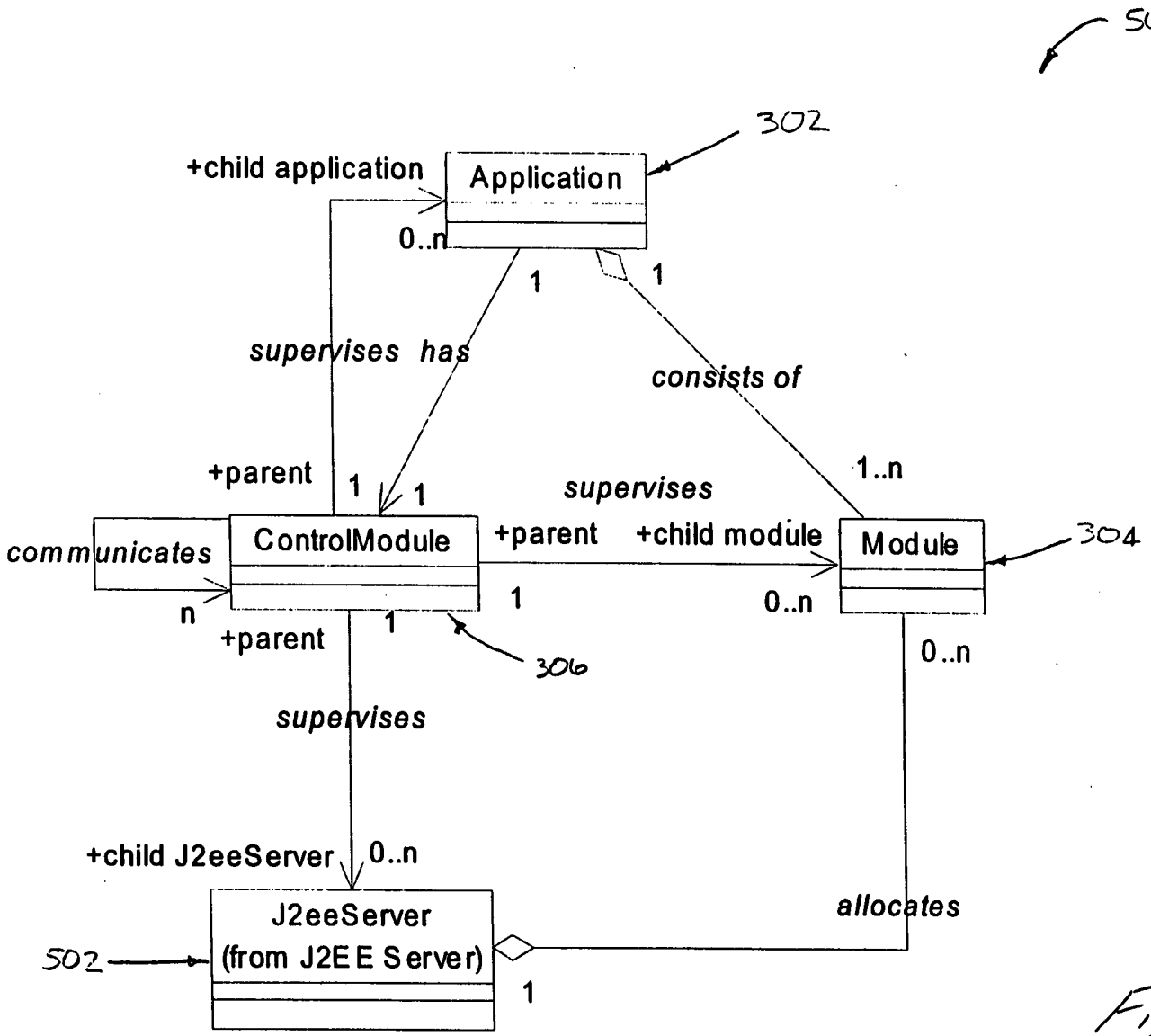
500
302
+child application
Application
0..n
1
1
supervises
has
consists of
+parent
1
1
supervises
1..n
communicates
ControlModule
+parent
+child module
Module
304
n
1
0..n
+parent
1
306
0..n
supervises
+child J2eeServer
0..n
allocates
J2eeServer
(from J2EE Server)
502
1

Fig. 5

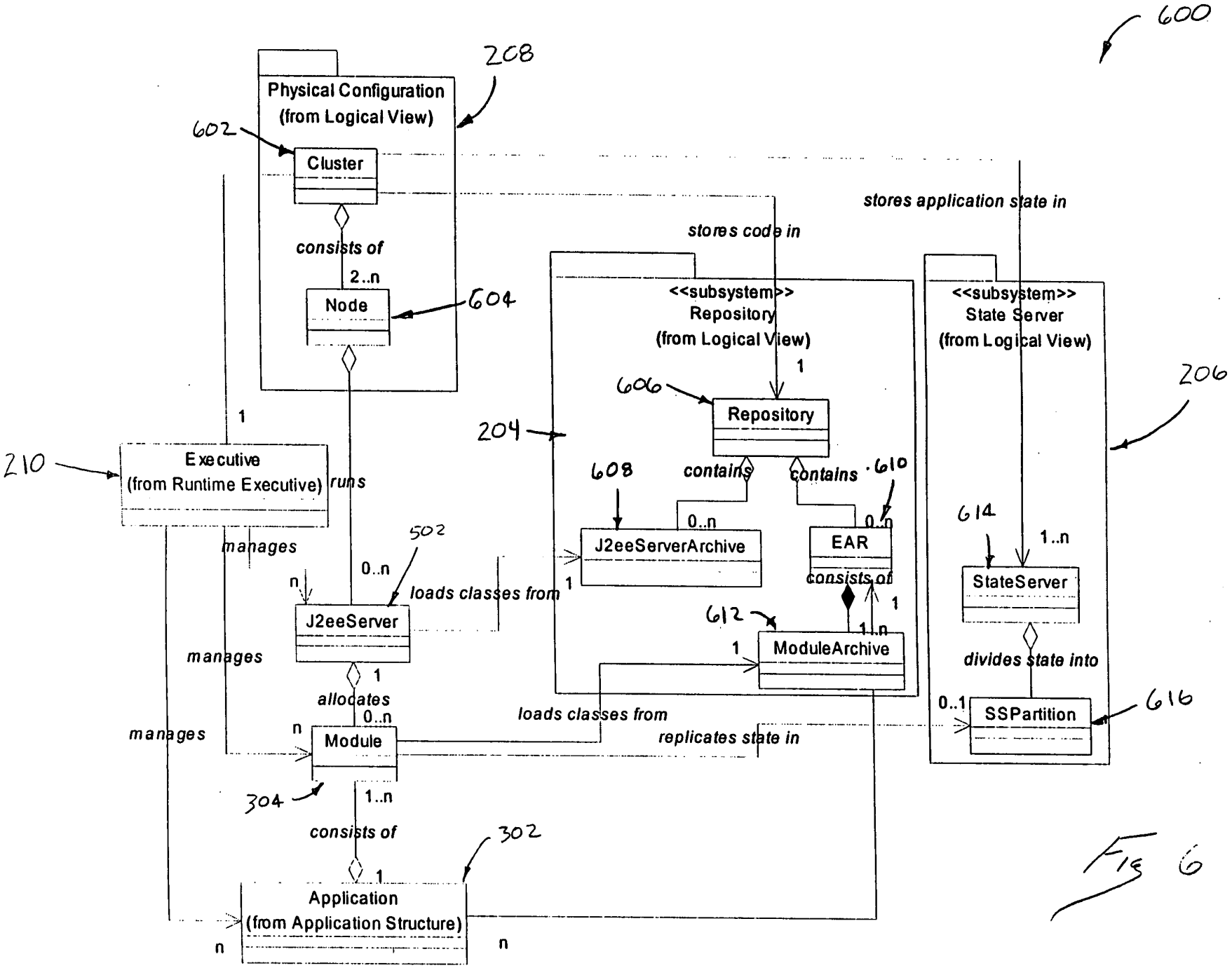
600
208
Physical Configuration
(from Logical View)
602
Cluster
consists of
2..n
Node
604
stores code in
stores application state in
<<subsystem>>
Repository
(from Logical View)
1
606
Repository
204
<<subsystem>>
State Server
(from Logical View)
206
210
Executive
(from Runtime Executive)
runs
1
608
contains
contains
610
0..n
0..n
J2eeServerArchive
EAR
consists of
1
1..n
612
ModuleArchive
614
1..n
StateServer
divides state into
manages
0..n
502
loads classes from
n
J2eeServer
manages
1
allocates
0..n
n
Module
manages
loads classes from
replicates state in
0..1
SSPartition
616
304
1..n
consists of
302
1
Application
(from Application Structure)
n
n

Fig 6

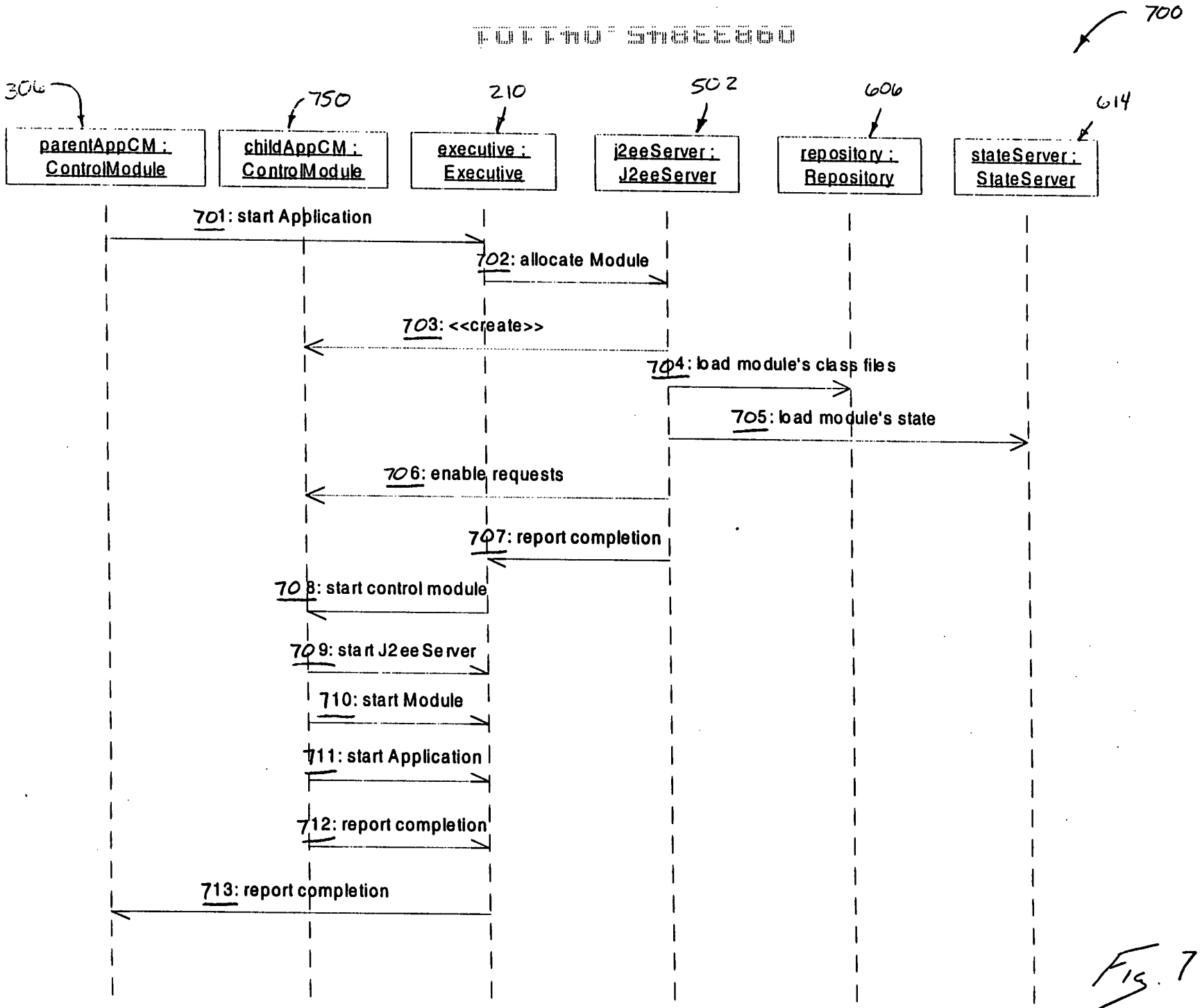
700
306
750
210
502
606
614
parentAppCM : ControlModule
childAppCM : ControlModule
executive : Executive
j2eeServer : J2eeServer
repository : Repository
stateServer : StateServer
701: start Application
702: allocate Module
703: <<create>>
704: load module's class files
705: load module's state
706: enable requests
707: report completion
708: start control module
709: start J2ee Server
710: start Module
711: start Application
712: report completion
713: report completion

Fig. 7

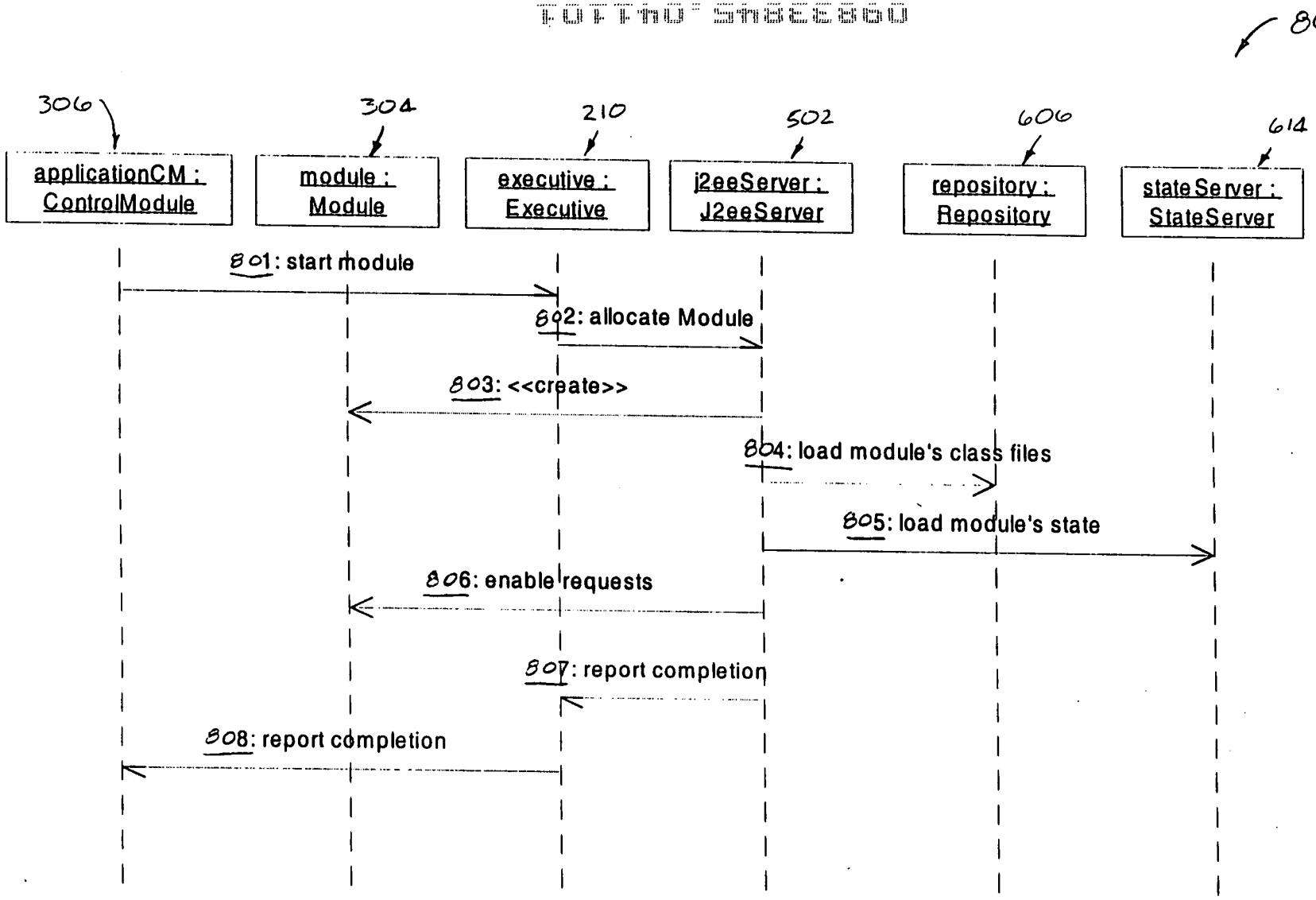
800
306
304
210
502
606
614
applicationCM : ControlModule
module : Module
executive : Executive
j2eeServer : J2eeServer
repository : Repository
stateServer : StateServer
801: start module
802: allocate Module
803: <<create>>
804: load module's class files
805: load module's state
806: enable requests
807: report completion
808: report completion

Fig. 8

FOUND SHEET BOX

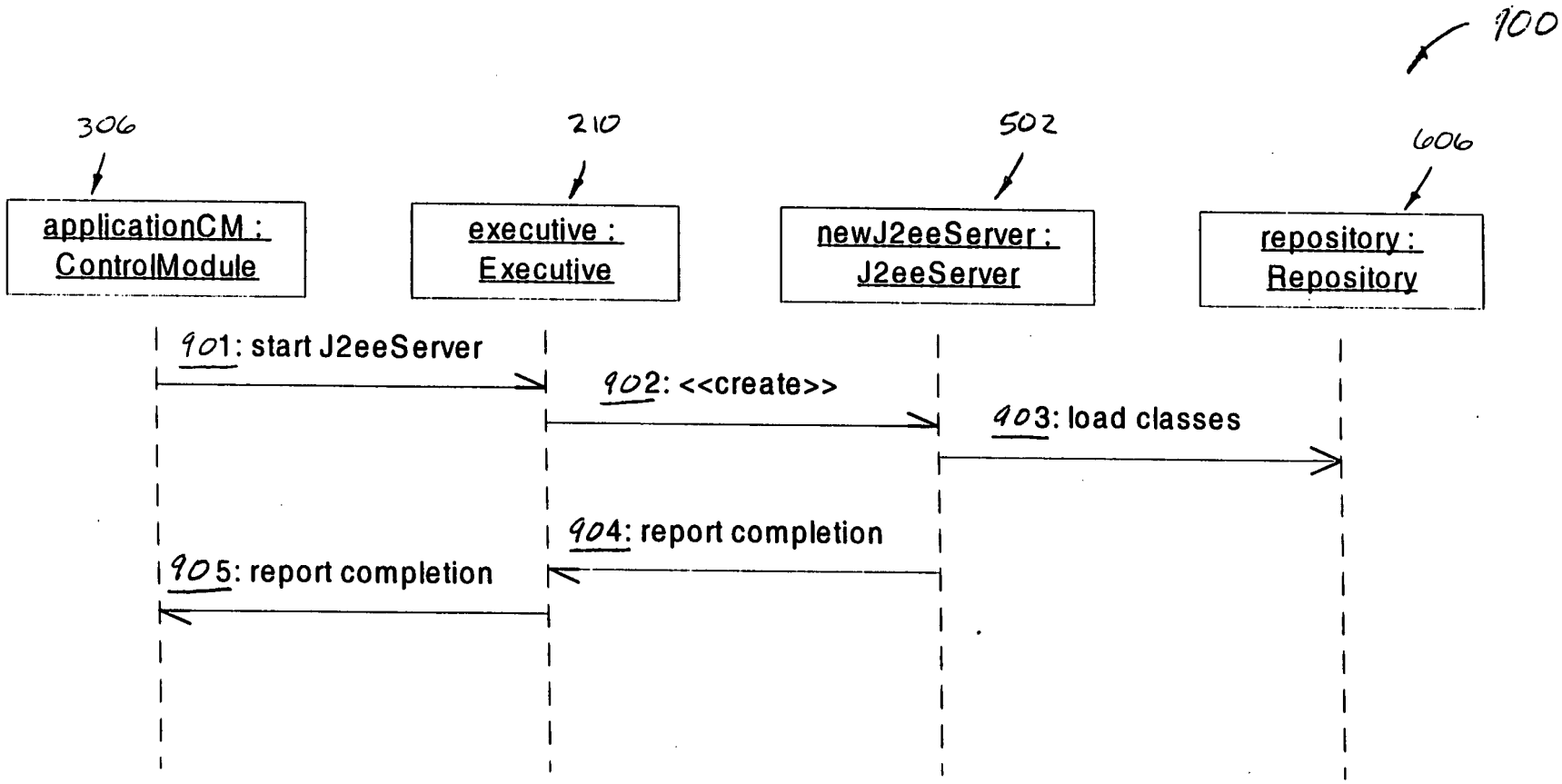

Fig 9

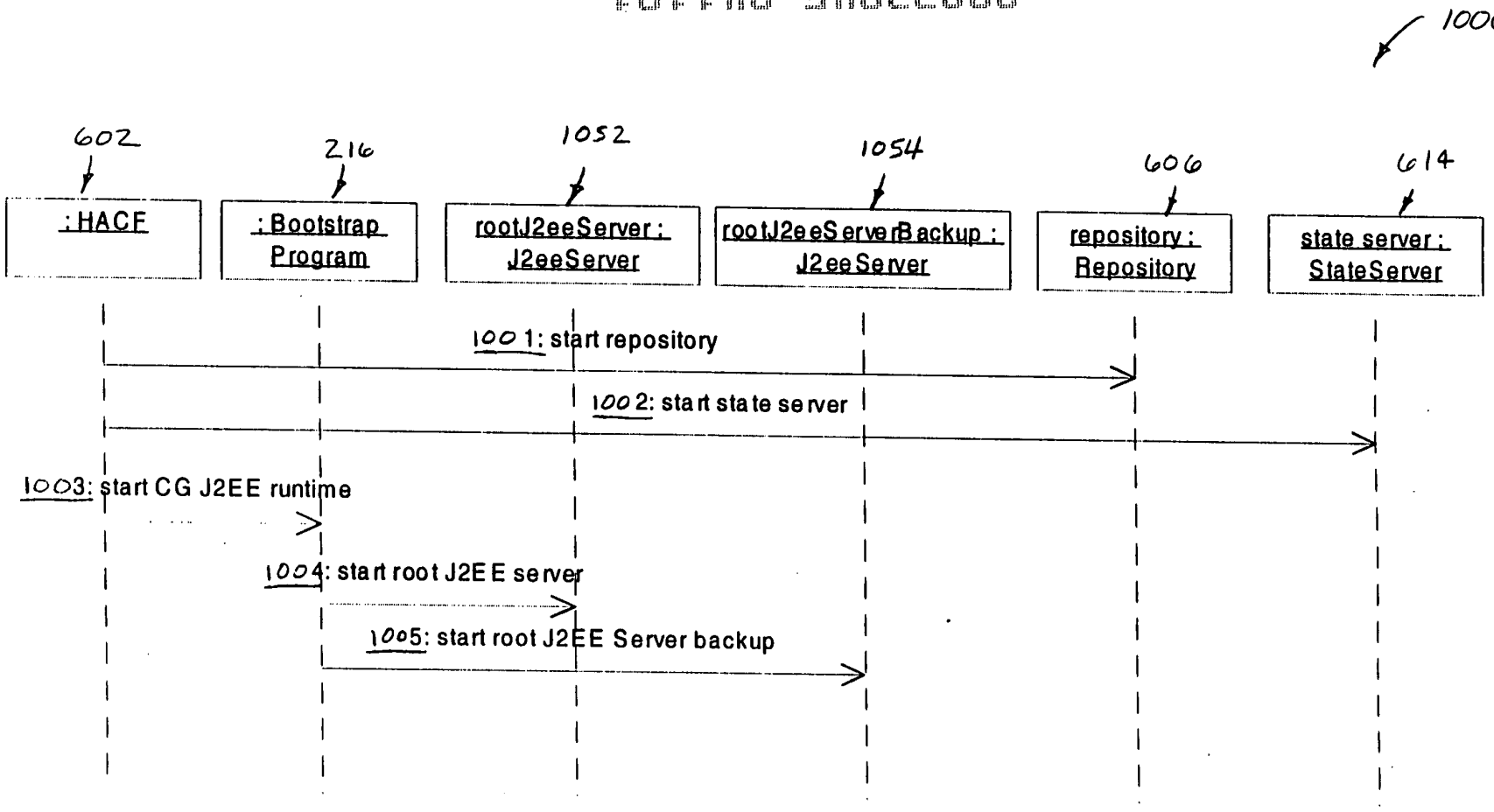
1000
602
216
1052
1054
606
614
:HACF
:Bootstrap Program
rootJ2eeServer : J2eeServer
rootJ2eeServerBackup : J2eeServer
repository : Repository
state server : StateServer
1001: start repository
1002: start state server
1003: start CG J2EE runtime
1004: start root J2EE server
1005: start root J2EE Server backup

Fig 10A

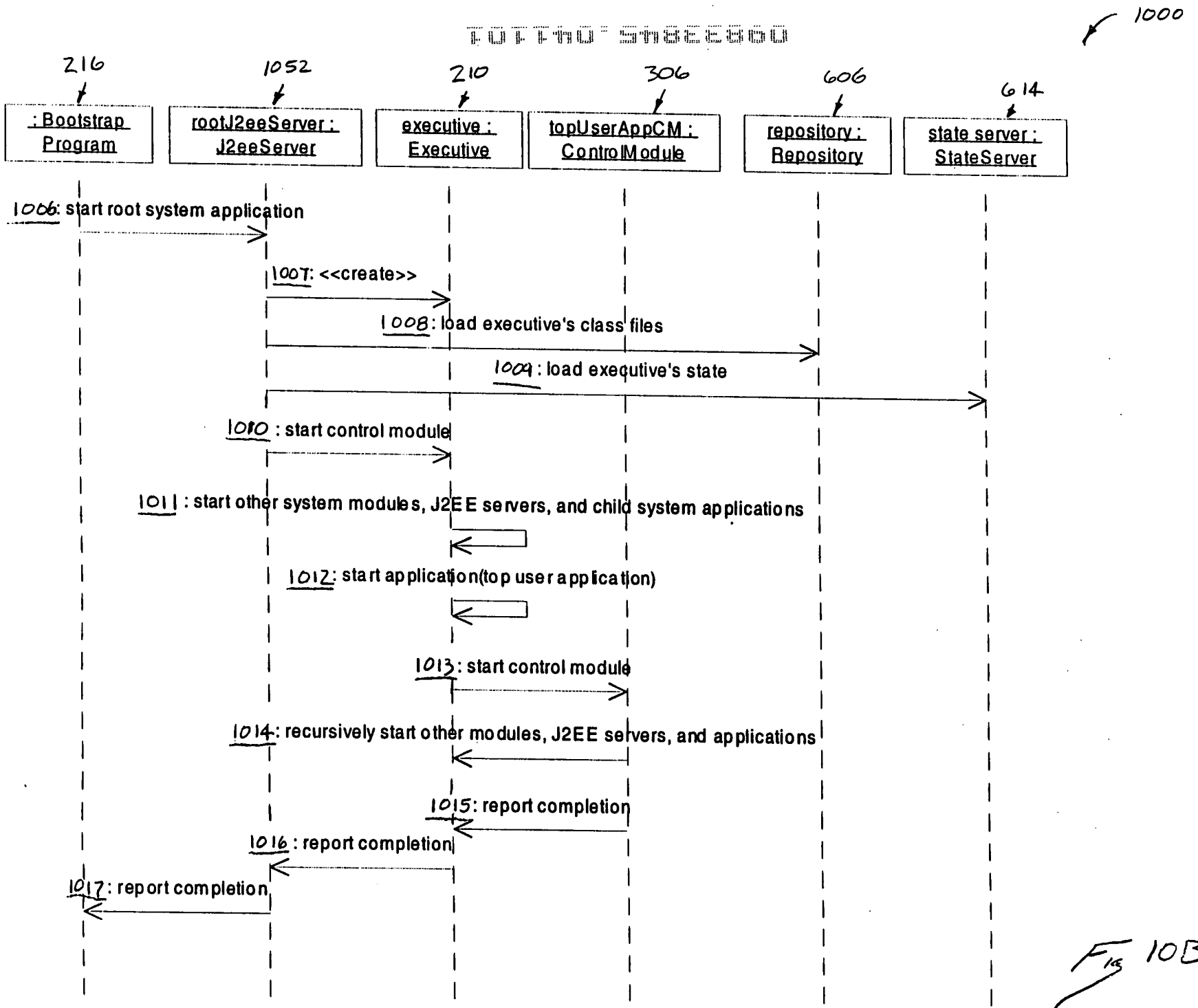
1000
216
1052
210
306
606
614
: Bootstrap Program
rootJ2eeServer : J2eeServer
executive : Executive
topUserAppCM : ControlModule
repository : Repository
state server : StateServer
1006: start root system application
1007: <<create>>
1008: load executive's class files
1009: load executive's state
1010 : start control module
1011 : start other system modules, J2EE servers, and child system applications
1012: start application(top user application)
1013: start control module
1014: recursively start other modules, J2EE servers, and applications
1015: report completion
1016 : report completion
1017: report completion

Fig 10B

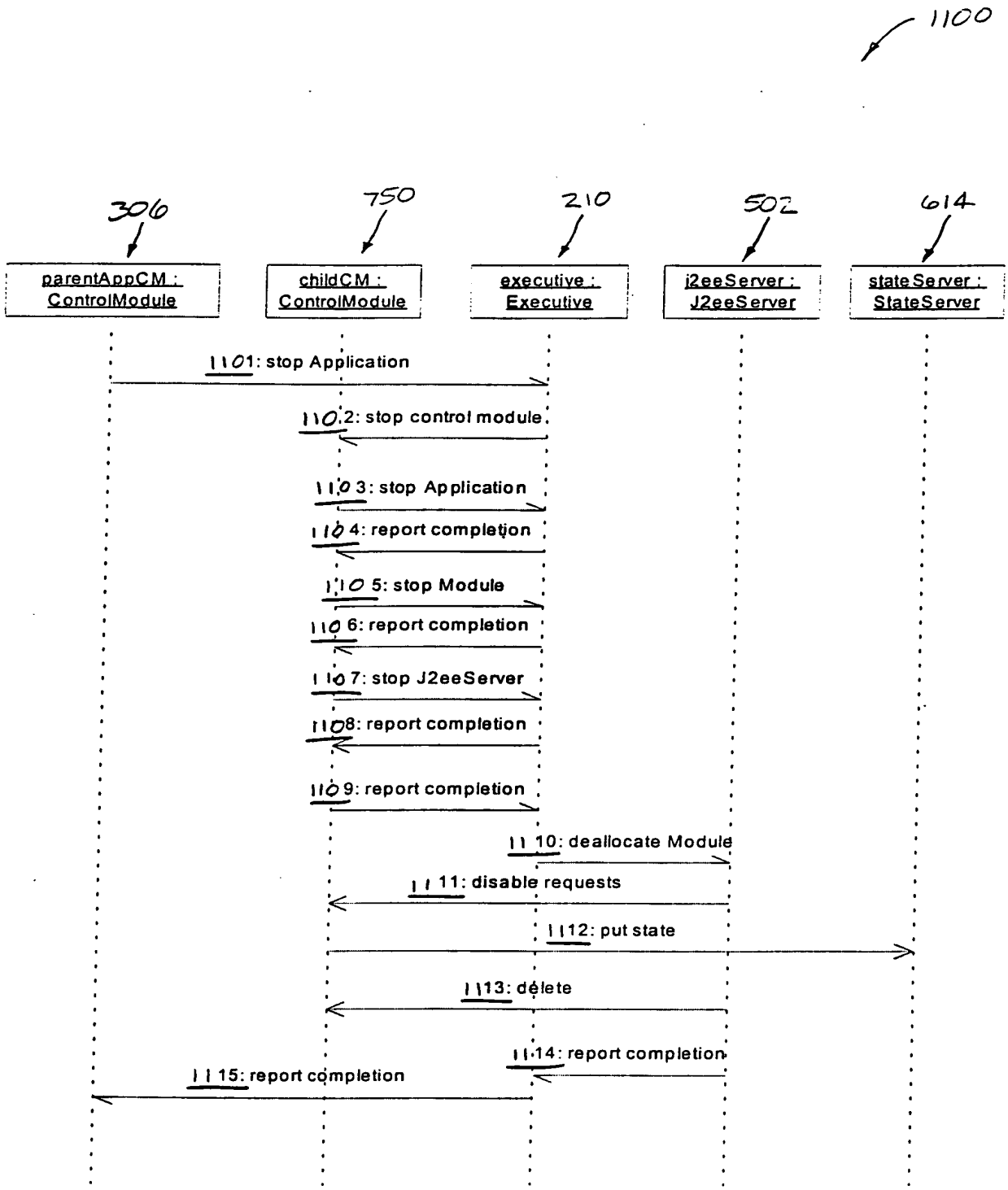
1100
306
750
210
502
614
parentAppCM : ControlModule
childCM : ControlModule
executive : Executive
j2eeServer : J2eeServer
stateServer : StateServer
1101: stop Application
1102: stop control module
1103: stop Application
1104: report completion
1105: stop Module
1106: report completion
1107: stop J2eeServer
1108: report completion
1109: report completion
1110: deallocate Module
1111: disable requests
1112: put state
1113: delete
1114: report completion
1115: report completion

Fig. 11

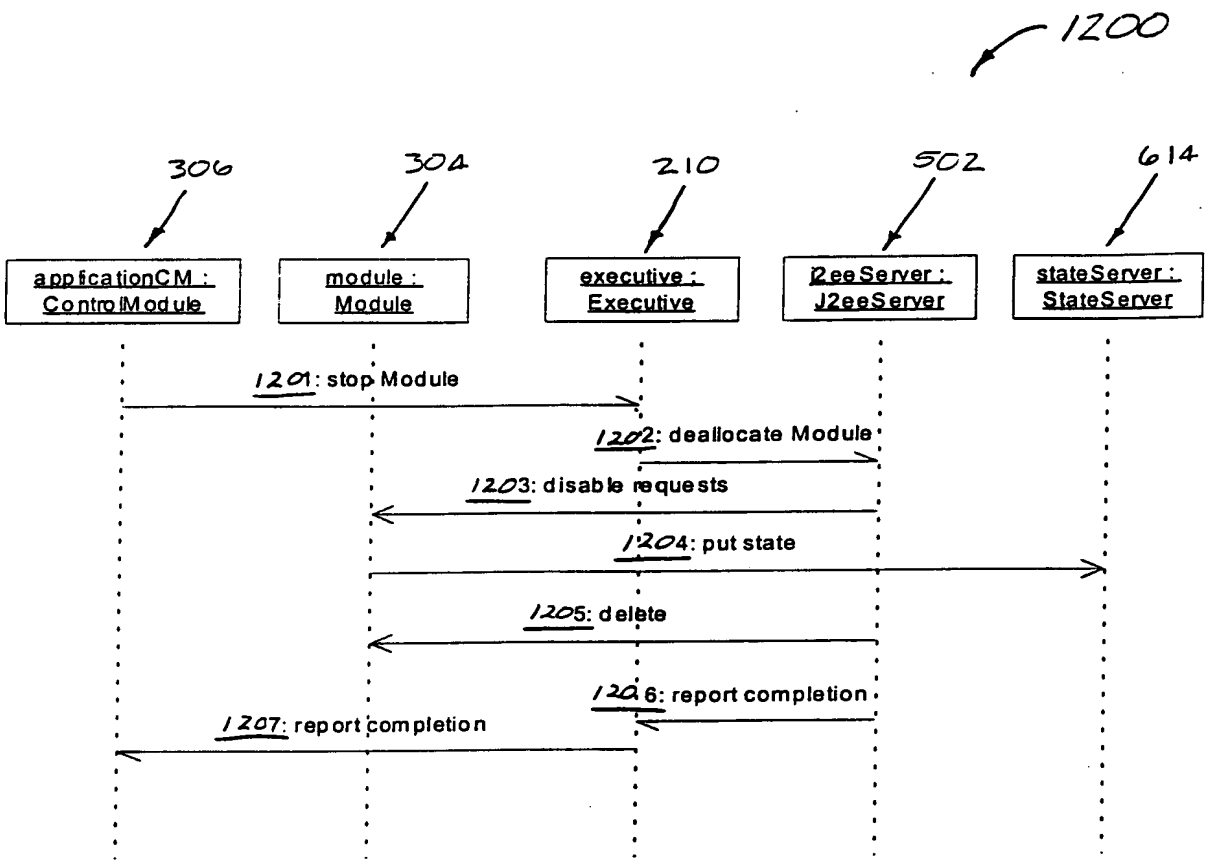
1200
306
304
210
502
614
applicationCM : ControlModule
module : Module
executive : Executive
J2eeServer : J2eeServer
stateServer : StateServer
1201: stop Module
1202: deallocate Module
1203: disable requests
1204: put state
1205: delete
1206: report completion
1207: report completion

Fig. 12

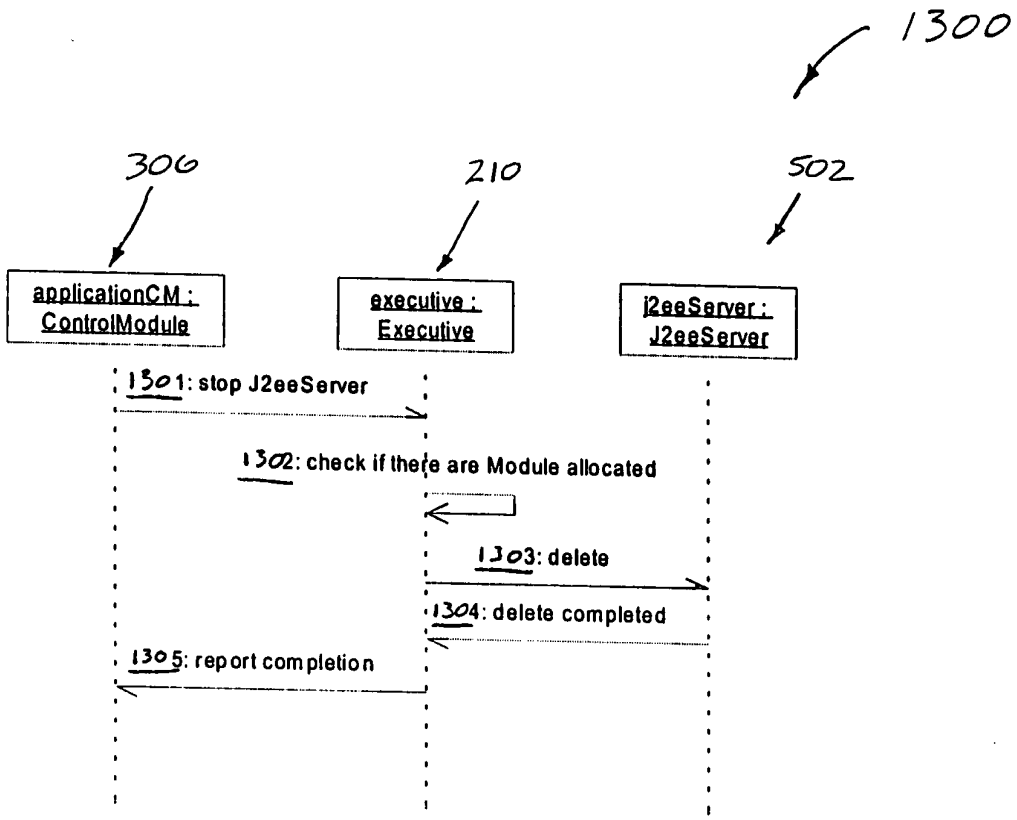
1300
306
210
502
applicationCM : ControlModule
executive : Executive
j2eeServer : J2eeServer
1301: stop J2eeServer
1302: check if there are Module allocated
1303: delete
1304: delete completed
1305: report completion

Fig. 13

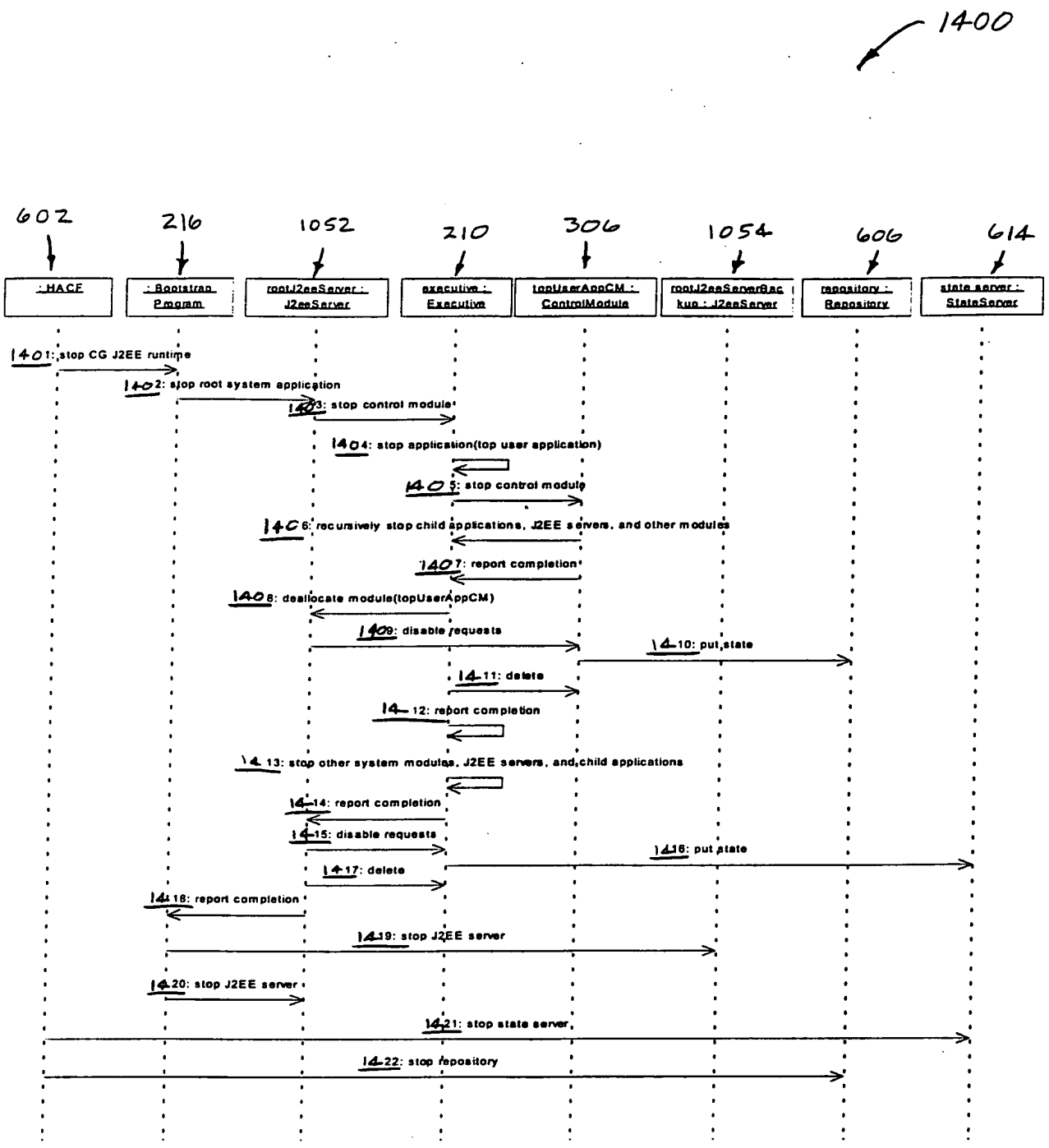
1400
602
216
1052
210
306
1054
606
614
: HACF
: Bootstrap Pmgmm
root/J2eeServer : J2eeServer
executive : Executive
topUserAppCM : ControlModule
root/J2eeServerBackup : J2eeServer
repository : Repository
state server : StateServer
1401: stop CG J2EE runtime
1402: stop root system application
1403: stop control module
1404: stop application(top user application)
1405: stop control module
1406: recursively stop child applications, J2EE servers, and other modules
1407: report completion
1408: deallocate module(topUserAppCM)
1409: disable requests
1410: put,state
1411: delete
1412: report completion
1413: stop other system modules, J2EE servers, and,child applications
1414: report completion
1415: disable requests
1416: put state
1417: delete
1418: report completion
1419: stop J2EE server
1420: stop J2EE server
1421: stop state server
1422: stop repository

Fig. 14

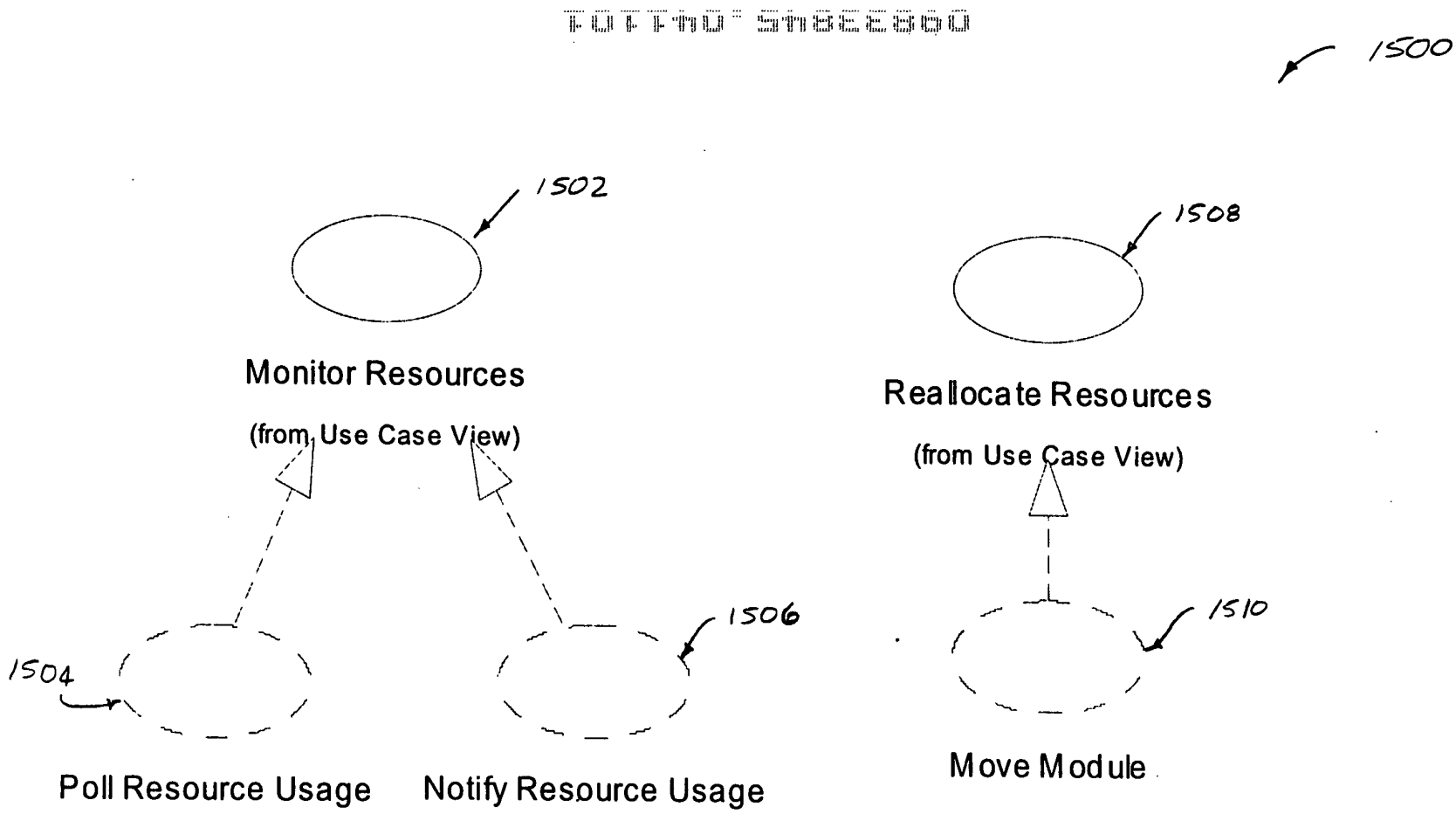
1500
1502
Monitor Resources
(from Use Case View)
1504
1506
Poll Resource Usage
Notify Resource Usage
1508
Reallocate Resources
(from Use Case View)
1510
Move Module

FIG 15

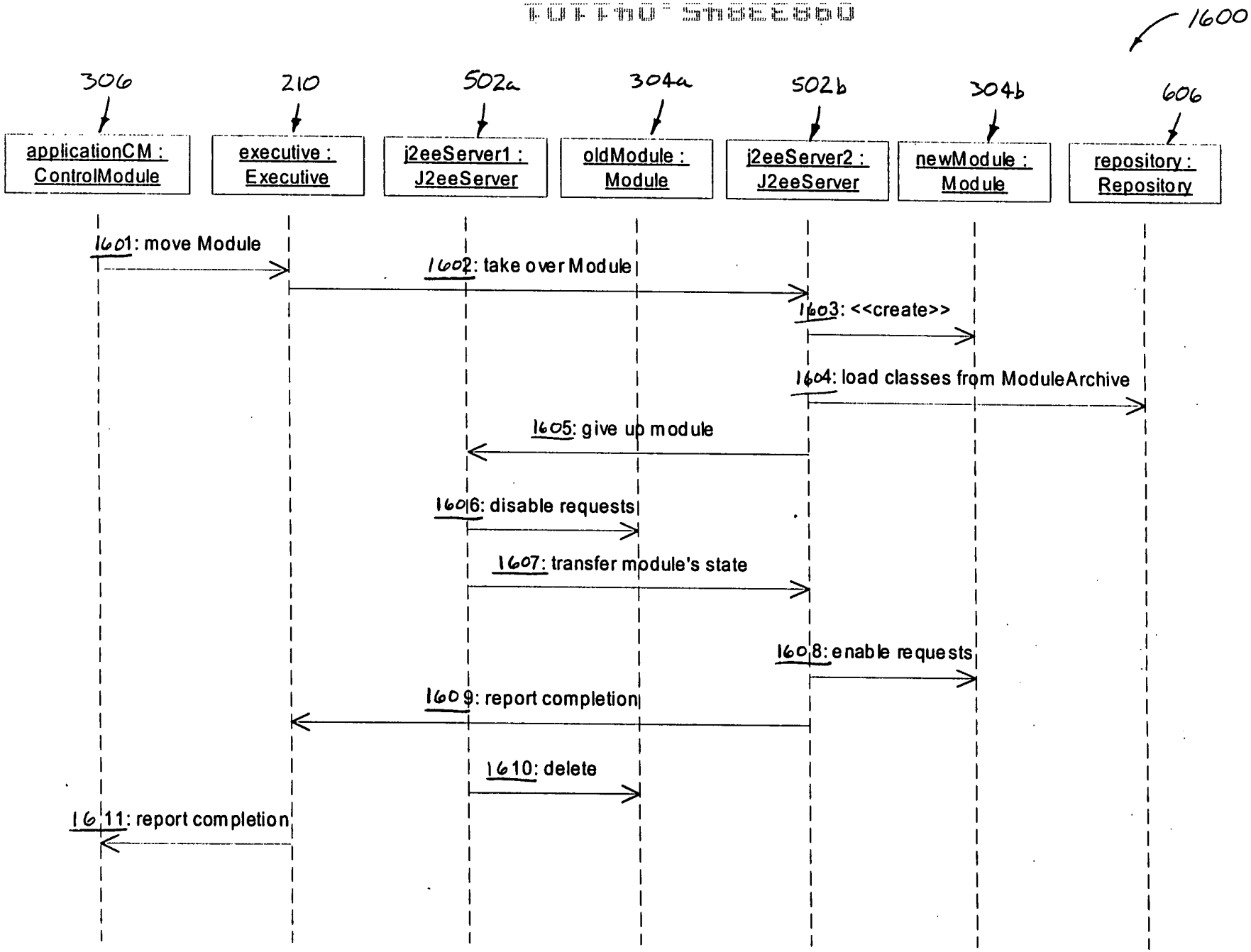
1600
306
210
502a
304a
502b
304b
606
applicationCM : ControlModule
executive : Executive
j2eeServer1 : J2eeServer
oldModule : Module
j2eeServer2 : J2eeServer
newModule : Module
repository : Repository
1601: move Module
1602: take over Module
1603: <<create>>
1604: load classes from ModuleArchive
1605: give up module
1606: disable requests
1607: transfer module's state
1608: enable requests
1609: report completion
1610: delete
1611: report completion

Fig. 16

PCT/US03/37360

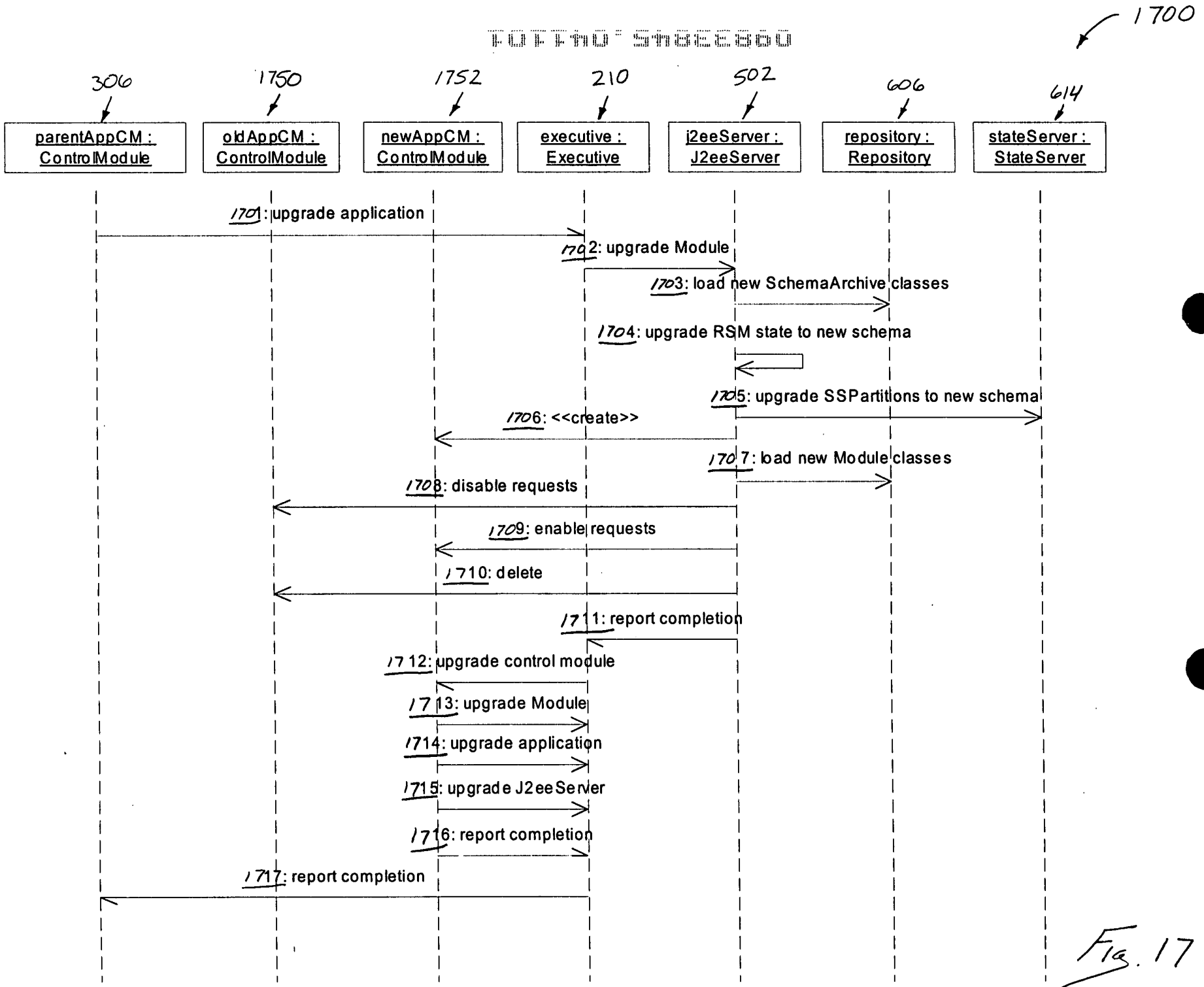

Fig. 17

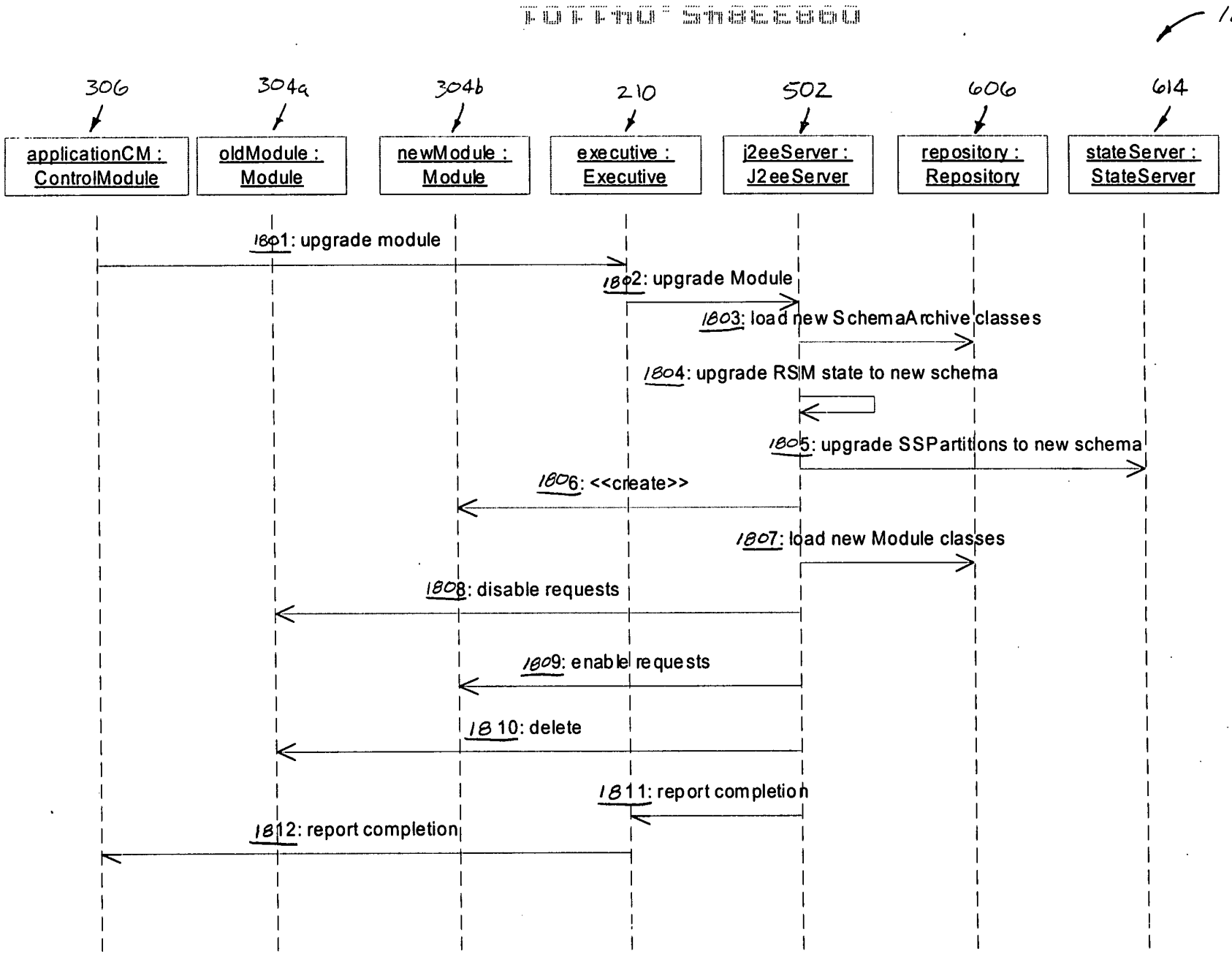
1800
306
304a
304b
210
502
6006
614
applicationCM : ControlModule
oldModule : Module
newModule : Module
executive : Executive
j2eeServer : J2eeServer
repository : Repository
stateServer : StateServer
1801: upgrade module
1802: upgrade Module
1803: load new SchemaArchive classes
1804: upgrade RSM state to new schema
1805: upgrade SSPartitions to new schema
1806: <<create>>
1807: load new Module classes
1808: disable requests
1809: enable requests
1810: delete
1811: report completion
1812: report completion

Fig 18

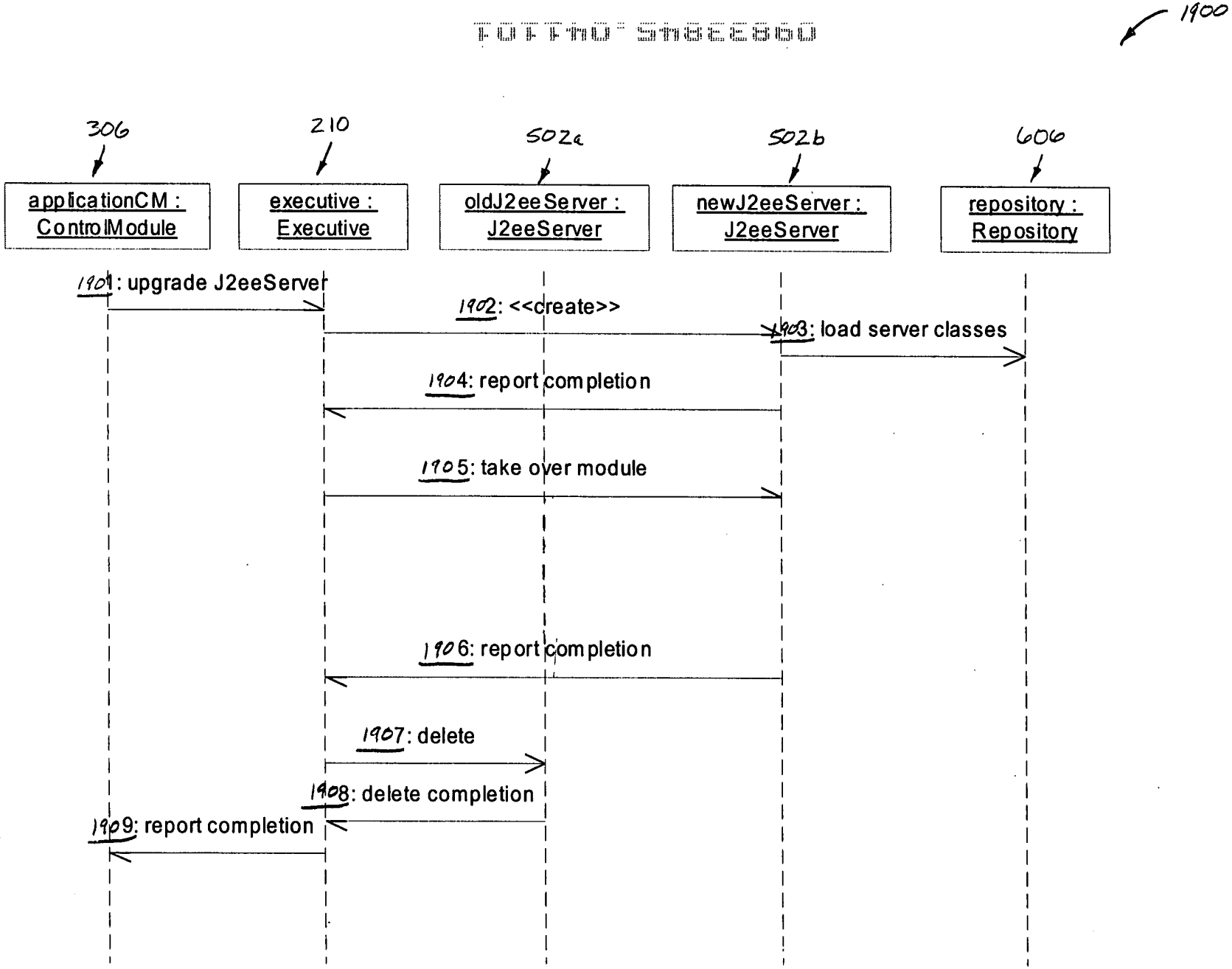
1900
306
210
502a
502b
606
applicationCM : ControlModule
executive : Executive
oldJ2eeServer : J2eeServer
newJ2eeServer : J2eeServer
repository : Repository
1901: upgrade J2eeServer
1902: <<create>>
1903: load server classes
1904: report completion
1905: take over module
1906: report completion
1907: delete
1908: delete completion
1909: report completion

Fig 19

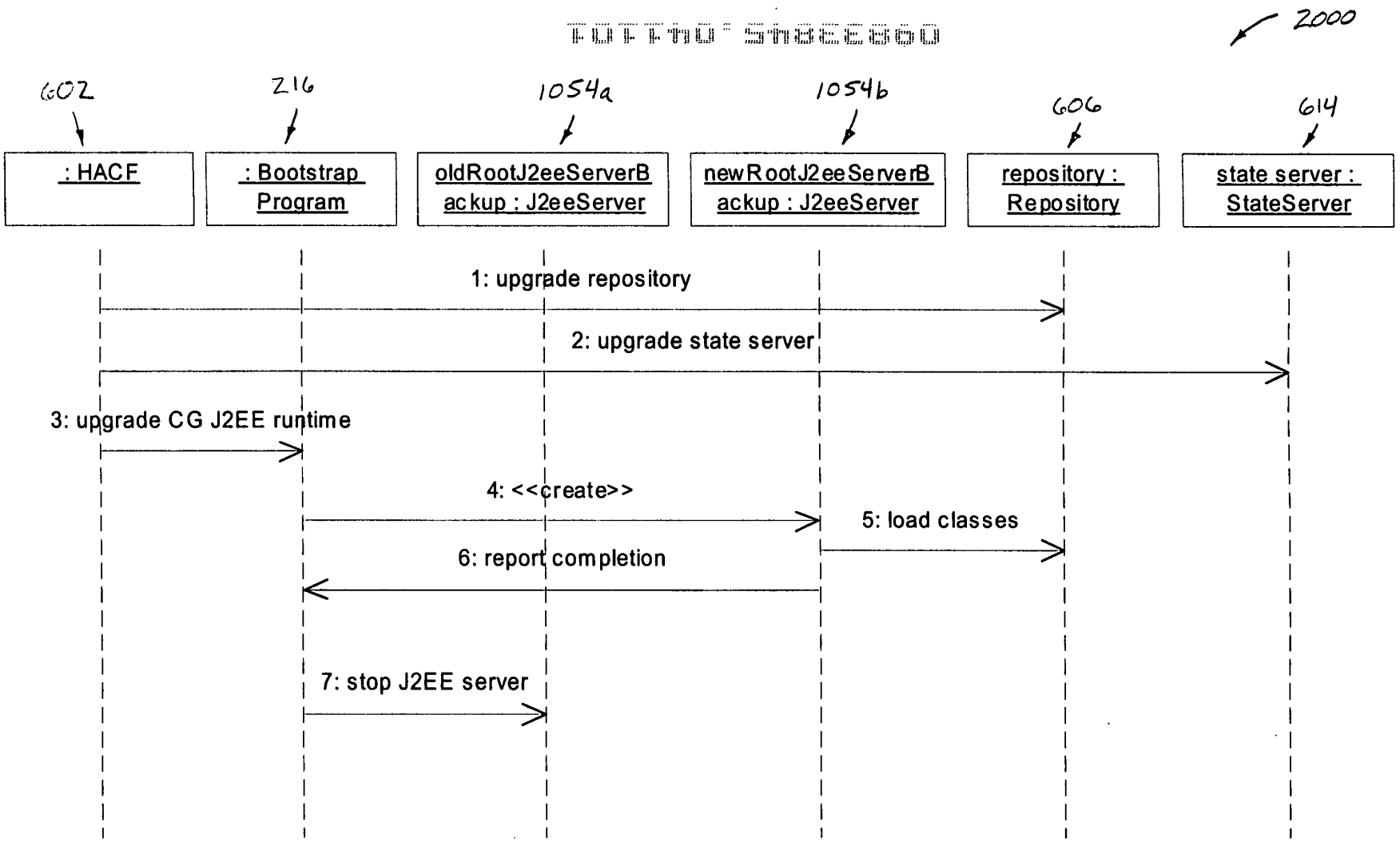
2000
602
216
1054a
1054b
606
614
: HACF
: Bootstrap Program
oldRootJ2eeServerBackup : J2eeServer
newRootJ2eeServerBackup : J2eeServer
repository : Repository
state server : StateServer
1: upgrade repository
2: upgrade state server
3: upgrade CG J2EE runtime
4: <<create>>
5: load classes
6: report completion
7: stop J2EE server

Fig 20

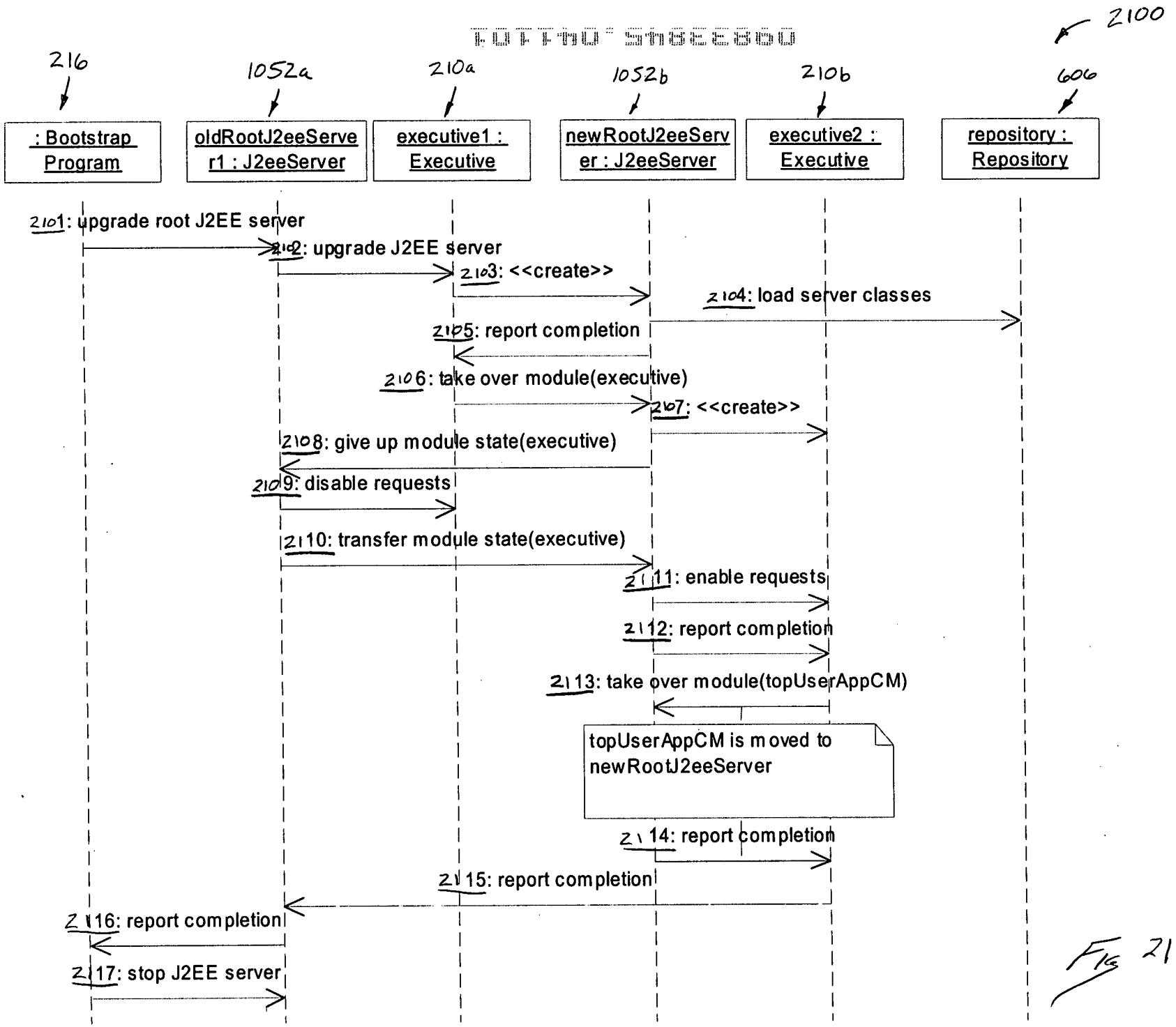
2100
216
1052a
210a
1052b
210b
606
: Bootstrap Program
oldRootJ2eeServer1 : J2eeServer
executive1 : Executive
newRootJ2eeServer : J2eeServer
executive2 : Executive
repository : Repository
2101: upgrade root J2EE server
2102: upgrade J2EE server
2103: <<create>>
2104: load server classes
2105: report completion
2106: take over module(executive)
2107: <<create>>
2108: give up module state(executive)
2109: disable requests
2110: transfer module state(executive)
2111: enable requests
2112: report completion
2113: take over module(topUserAppCM)
topUserAppCM is moved to newRootJ2eeServer
2114: report completion
2115: report completion
2116: report completion
2117: stop J2EE server

Fig 21

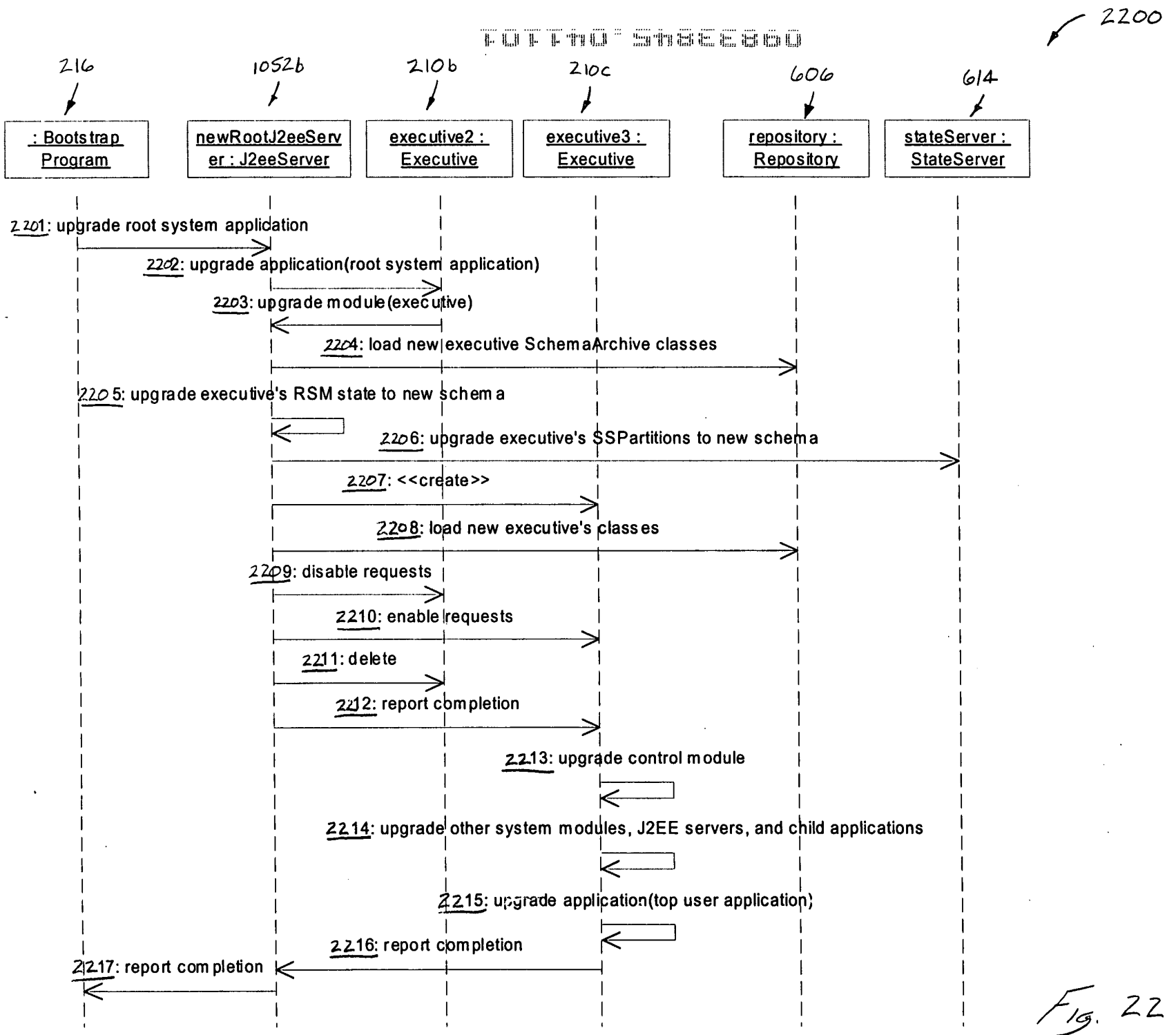
2200
2202
216
1052b
210b
210c
606
614
: Bootstrap Program
newRootJ2eeServer : J2eeServer
executive2 : Executive
executive3 : Executive
repository : Repository
stateServer : StateServer
2201: upgrade root system application
2202: upgrade application(root system application)
2203: upgrade module(executive)
2204: load new executive SchemaArchive classes
2205: upgrade executive's RSM state to new schema
2206: upgrade executive's SSPartitions to new schema
2207: <<create>>
2208: load new executive's classes
2209: disable requests
2210: enable requests
2211: delete
2212: report completion
2213: upgrade control module
2214: upgrade other system modules, J2EE servers, and child applications
2215: upgrade application(top user application)
2216: report completion
2217: report completion

Fig. 22